



**AIM (Analyzing Instructional Materials)**Evaluation Process and Tools for Selecting and Implementing Instructional Materials

January 10 and 11, 2007

Synopsys, Partnership for Student Success in Science





AIM is a collaboration between the BSCS Center for Professional Development and WestEd, building on the original work of the K-12 Alliance of WestEd.

**Goals**

* Understand and apply AIM (Analyzing Instructional Materials) as a process to gather and analyze evidence to inform decisions regarding selection and/or implementation of instructional materials.
* Understand and use AIM as a professional development strategy focused on instructional materials and student learning.
* Explore how science concepts are developed and supported in standards-based instructional materials.

**AIM includes . . .**



**The AIM Process**

Paper Screen Implementation





**Score Sheet for AIM Process: Paper Screen**



**AIM Summary Sheet: Strengths and Limitation**



In ***How People Learn*** *(National Research Council, 2000),* the authors summarize three key ideas about learning based on an exhaustive study of the research (pp.14-19). These three findings about student learning have parallel implications for classroom instruction (pp. 19-21), which then suggest a translation of those implications into curriculum materials. As the authors’ state, these three findings imply the following for students and teachers:

|  |  |  |  |
| --- | --- | --- | --- |
| **Key Findings** | **Key Findings for Students** | **Key Findings for Teachers** | **How can instructional materials be designed in response to these findings?** |
| First | Students come to the classroom with preconceptions about how the world works. If their initial knowledge is not engaged, they may fail to grasp the new concepts and information that are taught, or they may learn them for purposes of a test but revert to their preconceptions outside the classroom. | Recognize preconceptions and adjust instruction |  |
| **Second** | To develop competence in an area of a science discipline, students must (a) have a deep foundation of usable knowledge, (b) understand facts and ideas in the context of a conceptual framework, and (c) be able to organize that knowledge in ways that facilitate retrieval and application. | Understand the content and conceptual framework for a discipline  Provide examples for context |  |
| **Third** | Students must be taught explicitly to take control of their own learning by defining goals and monitoring their progress in achieving them. | Provide class time for goal setting and analysis  Teach metacognitive skills |  |

#### Elements in Instructional Materials That Address the Key Findings from *How People Learn*

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| --- | --- |
| **Key Findings** | **Instructional Materials** |
| First | * Include structured strategies to elicit and challenge student preconceptions * Incorporate background for the teacher about common preconceptions |
| Second | * Be organized around a conceptual framework * Connect factual information to the framework * Provide relevant examples to illustrate key ideas |
| Third | * Make learning goals explicit * Integrate metacognitive skill development into content |

### *Gathering Evidence*

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Careers in

Science



= Major Concepts

Icons = Work Students Do

= Assessments

* = Real World Applications

= Weak Connections

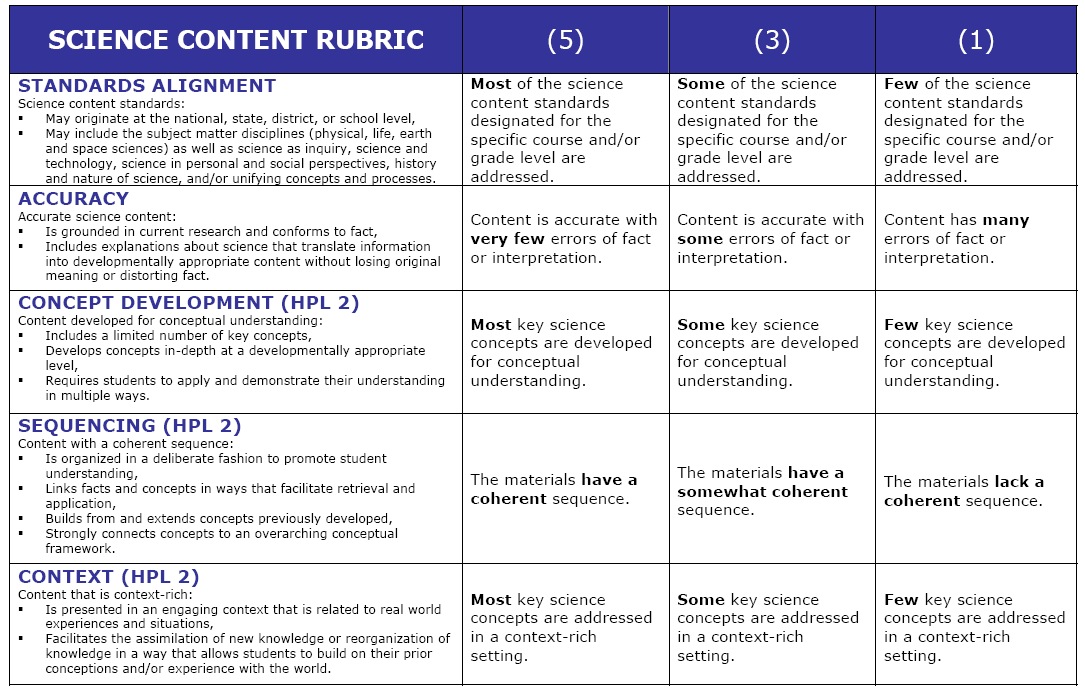
= Strong Connections

### *CFD*CFD%20with%20Pitt%20graphic*Science Content: Conceptual Flow Graphic*

An example of a graphic organizer from the **AIM Process**

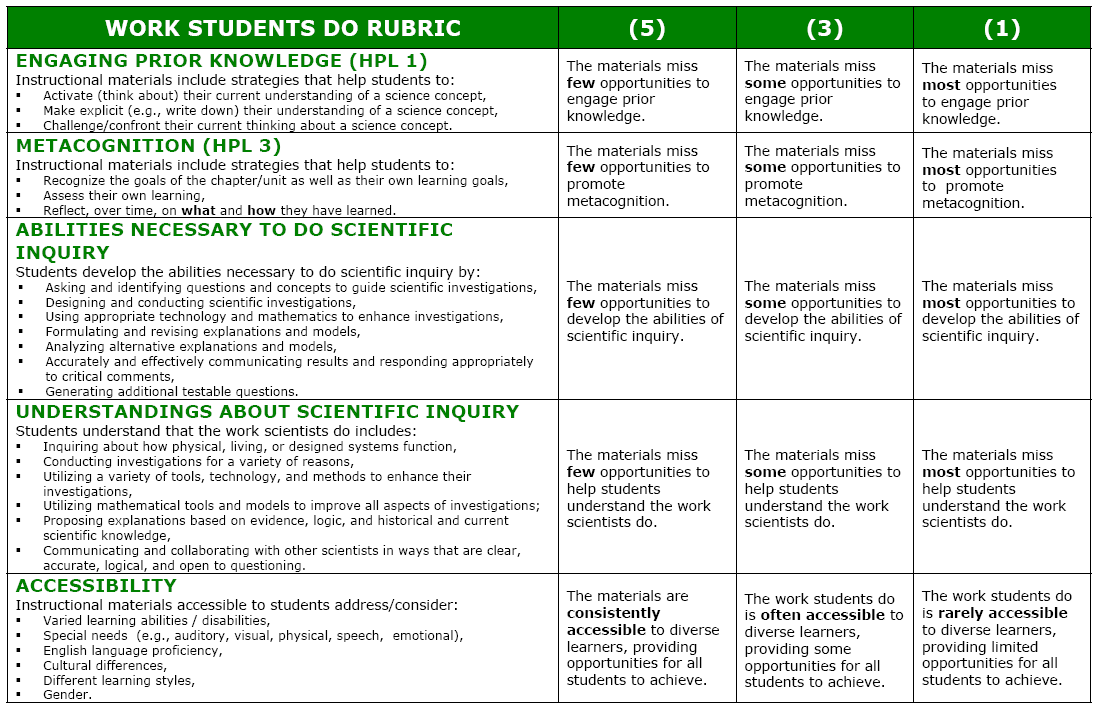
showing how teachers might illustrate the connections among major concepts

in a unit from BSCS Biology: A Human Approach



***Strengths and Limitations: Science Content***

|  |  |  |  |
| --- | --- | --- | --- |
| **Criteria and Components** | | **Summary of Strengths** | **Summary of Limitations** |
| **Content** | **Standards Alignment** |  |  |
| **Accuracy** |  |  |
| **Concept Development (HPL 2)** |  |  |
| **Sequencing (HPL 2)** |  |  |
| **Context (HPL 2)** |  |  |

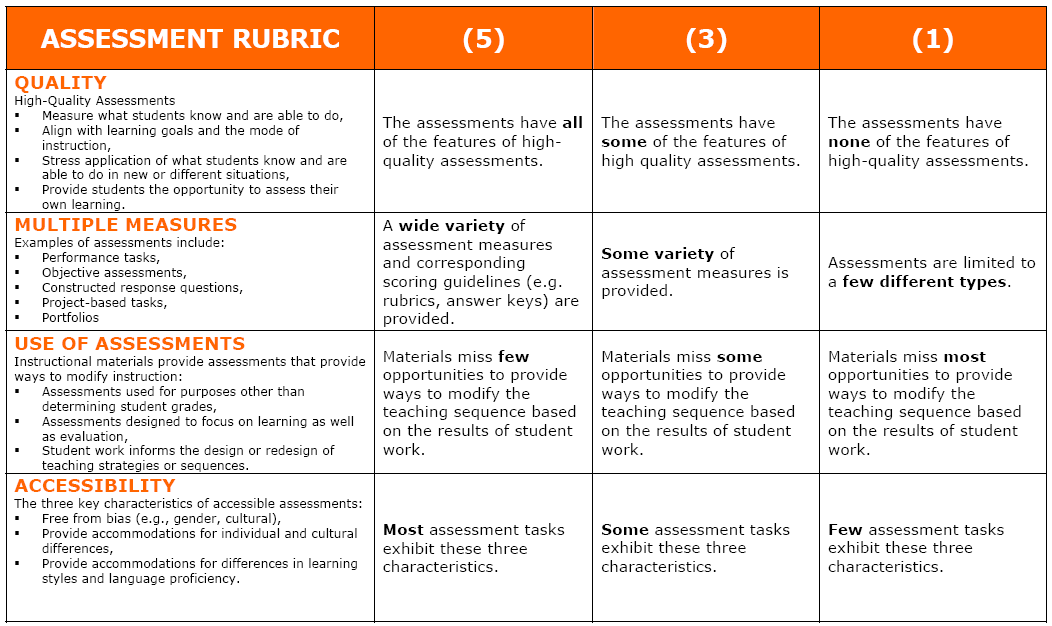


**Work Students Do: Evidence Chart**

|  |  |  |
| --- | --- | --- |
| **Type of Activity** | **Student Product** | **How does this activity build student understanding of the concept?** |
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***Strengths and Limitations: Work Students Do***

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| --- | --- | --- | --- |
| **Criteria and Components** | | **Summary of Strengths** | **Summary of Limitations** |
| **Work Students Do** | **Engaging Prior Knowledge (HPL 1)** |  |  |
| **Metacognition (HPL 3)** |  |  |
| **Abilities Necessary To Do Scientific Inquiry** |  |  |
| **Understandings About Scientific Inquiry** |  |  |
| **Accessibility** |  |  |



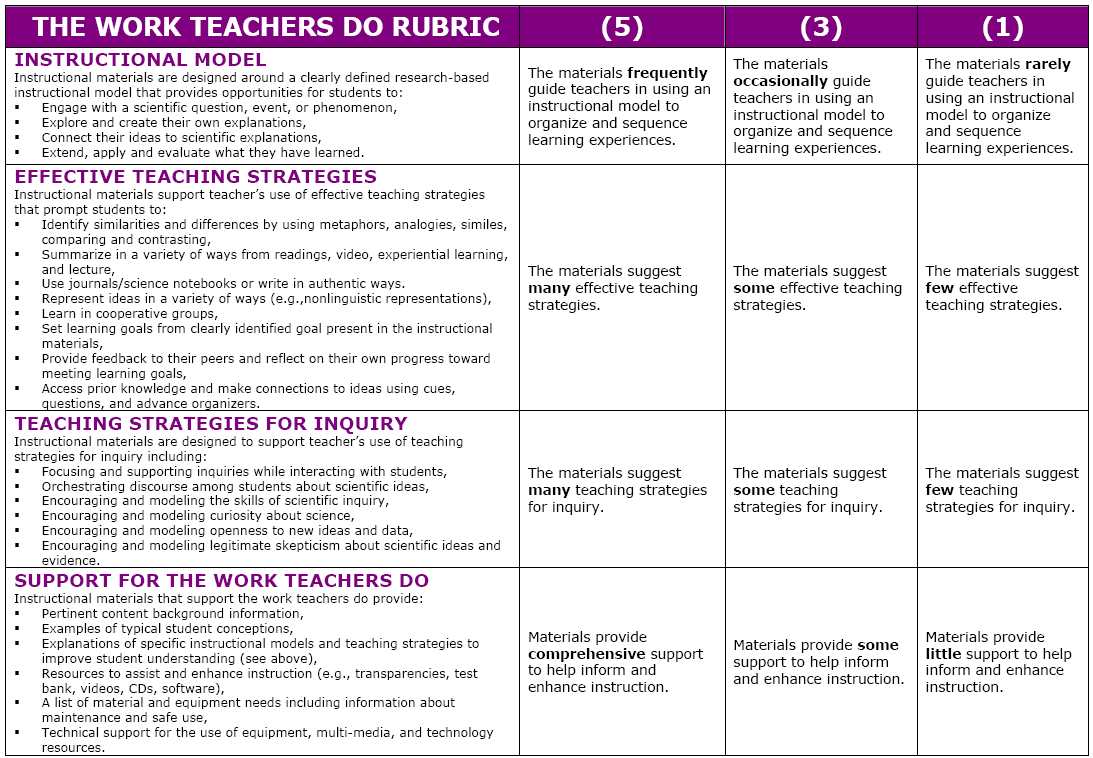
**Assessment: Evidence Chart**

Record the type of assessment in column one. In column two, list the page number of the assessment. In column three, describe how the assessment helps measure student understanding and inform instruction.

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| --- | --- | --- |
| **Type of Assessment** | **Page** | **Comments**  **How does the assessment measure student understanding?**  **Inform instruction?** |
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***Strengths and Limitations: Assessment***

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| **Criteria and Components** | | **Summary of Strengths** | **Summary of Limitations** |
| **Assessment** | **Quality** |  |  |
| **Multiple Measures** |  |  |
| **Use of Assessments** |  |  |
| **Accessibility** |  |  |

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**Work Teachers Do: Evidence Chart**

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| --- | --- |
| **Strategies**  (Instructional Model, Teaching Strategies [including inquiry] Assessment Strategies) | **Evidence of Support for implementing the strategies**  Pertinent content background information, explanations of specific teaching strategies to improve student understanding,resources to assist and enhance instruction (e.g. transparencies, test bank, videos, CDs, software),list of material and equipment needs including information about maintenance and safe use, technical support for the use of equipment, multi-media, and technology resources. |
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***Strengths and Limitations: Work Teachers Do***

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| --- | --- | --- | --- |
| **Criteria and Components** | | **Summary of Strengths** | **Summary of Limitations** |
| **The Work Teachers Do** | **Instructional Model** |  |  |
| **Effective Teaching Strategies** |  |  |
| **Teaching Strategies for Inquiry** |  |  |
| **Support for the Work Teachers Do** |  |  |

The BSCS Center for Professional Development offers a variety of professional development services.

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